## Space Weather Forecast

Issued on Monday, 03 January 2022 at 13:27 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Slight chance of Moderate solar activity until 4th January.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity was Very Low over the past 24 hours. There is currently 2 sunspot regions on the visible side of the Sun, with AR2918 rotating round to the far side early in the period. AR2916 is approaching the southwest horizon and remains a large mature region, but has been stable. AR2922, started the period as a simple bipolar region but has decayed and is now a single spot.
No Earth-directed Coronal Mass Ejections (CMEs) have been observed in the available imagery.

**Solar Wind / Geomagnetic Activity:** Solar wind speeds have generally been elevated or slightly elevated through the period, between 450 and 550 km/s, however they temporarily became strong between 03/0500 UTC and 03/0700 UTC, with a peak of 621 km/s at 03/0525 UTC. The total magnetic field strength has been weak, but a sustained period of weakly negative Bz was observed 03/0300 UTC to 03/0930 UTC. Geomagnetic activity has been mostly Quiet to Unsettled (Kp 1-3), but an Active (Kp 4) interval was recorded 03/0300-0600 UTC.

**Energetic Particles / Solar Radiation:** No solar radiation storms were observed.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Very Low or Low solar activity is expected, but with a slight chance of Moderate class flares on days 1 and 2 (3rd and 4th).

**Solar Wind / Geomagnetic Activity:** No Earth-directed CMEs are forecast. Elevated solar winds are expected to become slow through days 1 and 2 (3rd and 4th) as coronal hole effects wane. Quiet to Unsettled geomagnetic activity, with chance of Active intervals is expected on day 1 (3rd). Thereafter, predominantly Quiet activity is expected.

**Energetic Particles / Solar Radiation:** No solar radiation storms are expected.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 5 | 1 | 1 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 10 | 5 | 2 | 5 |
| Very Active | R3 to R5 X | No | 5 | 1 | 1 | 1 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 1 | 1 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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